

IN THE CLAIMS

Upon entry of the present amendment, the status of the claims will be as is shown below. This listing of claims replaces all previous versions and listings of claims in the present application.

Claims 1-37 (Cancelled)

38. (New) A fluid mixing device, comprising:

a chamber;

a bluff body defining one end of the chamber;

a first fluid inlet disposed in said chamber opposite from said bluff body;

a flow divider defined by an internal periphery and an external periphery;

at least one second fluid inlet to said chamber defined by said flow divider in a region substantially surrounding said bluff body;

at least one mixed fluid outlet from said chamber defined by said flow divider in a region substantially surrounding said bluff body,

wherein said at least one mixed fluid outlet is defined by a greater portion of the internal periphery than said at least one second fluid inlet, and said at least one second fluid inlet is defined by a greater portion of the external periphery than said at least one mixed fluid outlet, such that a center of any of said at least one second fluid inlet is closer to said

external periphery than a center of any of said at least one mixed fluid outlet.

39. (New) A fluid mixing device as claimed in claim 38, wherein said bluff body includes an egress for releasing fluid from said chamber.

40. (New) A fluid mixing device as claimed in claim 39, wherein said egress includes material porous to said fluids forming at least part of said bluff body.

41. (New) A fluid mixing device as claimed in claim 39, wherein said egress includes one or more apertures extending through said bluff body.

42. (New) A fluid mixing device as claimed in claim 41, wherein said bluff body includes a centrally disposed aperture.

43. (New) A fluid mixing device as claimed in claim 42, wherein said first fluid inlet is directed substantially toward said centrally disposed aperture.

44. (New) A fluid mixing device as claimed in claim 43, wherein said aperture has a circular cross section.

45. (New) A fluid mixing device as claimed claim 38, wherein said flow divider defines a series of flow channels which form said second fluid inlets and said mixed fluid outlets.

46. (New) A fluid mixing device as claimed in claim 45, wherein alternate ones of said flow channels spaced around said bluff body form said second fluid inlets and said mixed fluid outlets.

47. (New) A fluid mixing device as claimed in claim 46 wherein said flow divider has a corrugated profile so as to repeatedly cross said region surrounding the bluff body.

48. (New) A fluid mixing device as claimed in claim 47 wherein said chamber includes an outer wall extending substantially around the perimeter of said region surrounding the bluff body.

49. (New) A fluid mixing device as claimed in claim 48 wherein said corrugated profile alternately contacts the bluff body and said outer wall.

50. (New) A fluid mixing device as claimed in claim 49, wherein the geometric centers of the cross-section of each of the flow channels defined by said corrugated profile are alternately substantially closer to the outer wall and substantially closer to the bluff body.

51. (New) A fluid mixing device as claimed in claim 50 wherein the flow channels having cross-sections with geometric centers substantially closer to the outer wall form said second fluid inlets and the flow channels having cross-sections with geometric centers substantially closer to the bluff body form said mixed fluid outlets.

52. (New) A fluid mixing device as claimed in claim 47, wherein said corrugated profile is of triangular form so that said flow channels are generally triangular in cross section.

53. (New) A fluid mixing device as claimed in claim 52, wherein at least alternate flow channels have substantially the same cross section size.

54. (New) A fluid mixing device as claimed in claim 53, wherein said corrugated profile defines eight flow channels forming second fluid inlets each alternately interposed with eight flow channels forming mixed fluid outlets.

55. (New) A fluid mixing device as claimed in claim 54, wherein the mixing device has eight-fold azimuthal symmetry about a longitudinal axis.

56. (New) A fluid mixing device as claimed in claim 38, wherein the flow divider protrudes beyond said bluff body.

57. (New) A fluid mixing device as claimed in claim 38, wherein the flow divider extends into said chamber.

58. (New) A fluid mixing device as claimed in claim 38, wherein said first fluid inlet extends toward said bluff body from said opposite end of the chamber.

59. (New) A fluid mixing device as claimed in claim 58, wherein the spacing h of the first fluid inlet from said opposite end satisfies the relationship $0 < h/L < 1$

where L is the distance from the opposite end to the bluff body.

60. (New) A fluid mixing device as claimed in claim 59, wherein the ratio h/L is about 0.4.

61. (New) A fluid mixing device as claimed in claim 38, wherein said chamber is formed by a generally cup-shaped body with said bluff body disposed at or adjacent an open end of said cup-shaped body.

62. (New) A fluid mixing device as claimed in claim 61, wherein said first fluid inlet is centrally disposed in the base of said cup-shaped body.

63. (New) A fluid mixing device as claimed in claim 61, wherein said flow divider extends between the wall of said cup-shaped body adjacent the open end and said bluff body.

64. (New) A fluid mixing device as claimed in claim 63, wherein said flow divider is fixed to the wall of said cup-shaped body.

65. (New) A fluid mixing device as claimed in claim 38, wherein said mixing device is a burner.

66. (New) A fluid mixing device as claimed in claim 65, wherein said first fluid inlet supplies combustible fuel and said second fluid inlets supply air to the chamber.

67. (New) A fluid mixing device as claimed in claim 66, wherein said combustible fuel is a gaseous fuel.

68. (New) A fluid mixing device as claimed in claim 66, wherein said combustible fuel is a gaseous hydrocarbon fuel.

69. (New) The fluid mixing device of claim 38, wherein a direction of fluid entry to said chamber from said first fluid inlet is substantially opposite a direction of fluid entry to said chamber from said at least one second fluid inlet.